Examen U S

$$F(t) = (a_n/2 + \sum_{n=1}^{\infty} (a_n \cos n\omega_0 t + b_n \operatorname{sen} n\omega_0 t)$$

$$f(t) = \frac{1}{2L}\int_{-L}^{L} f(x)\,dx + \sum_{n=1}\left[\left(\frac{1}{L}\int_{-L}^{L} f(x)\cos(\omega_n x)\,dx\right)\right.$$

$$\left.\cos(\omega_n t) + \left(\frac{1}{L}\int_{-L}^{L} f(x)\operatorname{sen}(\omega_n x)\,dx\right)\operatorname{sen}(\omega_n t)\right]$$

$$\Delta\omega = \omega_n - \omega_{n-1} = \frac{n\pi}{L} - \frac{(n-1)\pi}{L} = \frac{n\pi - n\pi + \pi}{L} = \frac{\pi}{L}$$

$$f(t) = \frac{\pi}{2\pi L}\int_{-L}^{L} f(x)\,dx + \sum_{n=1}^{\infty}\frac{\pi}{\pi L}\left[\left(\int_{-L}^{L} f(x)\cos(\omega_n x)\,dx\right)\right.$$

$$\left.\cos(\omega_n t) + \left(\int_{-L}^{L} f(x)\operatorname{sen}(\omega_n x)\,dx\right)\operatorname{sen}(\omega_n t)\right]$$

$$f(t) = \frac{\Delta\omega}{2\pi}\int_{-L}^{L} f(x)\,dx + \sum_{n=1}^{\infty}\frac{\Delta\omega}{\pi}\left[\left(\int_{-L}^{L} f(x)\cos(n\Delta\omega x)\,dx\right)\right.$$

$$\left.\cos(n\Delta\omega t) + \left(\int_{-L}^{L} f(x)\operatorname{sen}(n\Delta\omega x)\,dx\right)\operatorname{sen}(n\Delta\omega t)\right]$$

$$f(t) = \left(\frac{1}{2\pi}\int_{-L}^{L} f(x)\,dx\right)\Delta\omega + \frac{1}{\pi}\sum_{k=1}^{n}\left[f(x)\cos(k\Delta\omega x)\,dx\right)$$

$$\cos(k\Delta\omega t) + \left(\int_{-L}^{L} f(x)\operatorname{sen}(k\Delta\omega x)\,dx\right)\operatorname{sen}(k\Delta\omega t)\Big]\Delta\omega$$

$$L \to \infty \qquad \Delta\omega \to 0$$

$$F(t) = \frac{1}{\pi}\int_{0}^{\infty}\left[\int_{-\infty}^{\infty} f(x)\cos(\omega x)\,dx\right)\cos(\omega t) + \left(\int_{-\infty}^{\infty}\right.$$

$$\left. f(x)\operatorname{sen}(\omega x)\,dx\right)\operatorname{sen}(\omega t)\Big]\,d\omega$$

$$\boxed{F(t) = \frac{1}{\pi} \int_{0}^{\infty} \left[A_\omega \operatorname{Cos}(\omega t) + B_\omega \operatorname{Sen}(\omega t) \right] d\omega}$$